Lipid Management for Adults

- Obtain an annual fasting lipid profile for both type 1 and type 2 diabetes, and more often if needed to achieve goals.
- The treatment goal for patients with diabetes is an LDL less than 100 mg/dl. For those patients with known significant high risk, as in macrovascular disease (CVD), the goal is an LDL less than 70 mg/dl.

Why is control of lipid abnormalities important?

Diabetes is one of the major risk factors for vascular disease, along with smoking, dyslipidemia, hypertension, and a family history of premature coronary heart disease. In type 2 diabetes there is an increased risk for obesity and lipid abnormalities that is independent of glycemic control. Because of the two to four fold increase in the prevalence of vascular disease in persons with diabetes, it is important to identify and manage all modifiable cardiovascular risk factors. The goal of lipid management is to prevent the development or progression of vascular disease.

What is the relationship between blood lipid levels and coronary heart disease risk?

Table 13 illustrates risk levels for coronary heart disease (CHD) with varying levels of LDL, HDL, and triglycerides in the general population. No clinical trial has been done on the effects of lipid-lowering agents on subsequent coronary heart disease in a diabetic population, though diabetic subjects have been included in some of the major trials such as the Scandinavian Simvistatin Survival Study (4S study), the Cholesterol and Recurrent Events Study (CARE Study), and the Helsinki Heart Study. The 4S and CARE studies provide evidence that pharmacologic therapy with statin drugs (HMG co-A reductase inhibitors) reduce CHD events (and mortality in 4S) in diabetic subjects with known CHD.

Table 13: Risk Levels for CHD and Blood Lipid Levels

CHD Risk	LDL (men and women)	HDL (men)	HDL (women)	Triglyceride (men and women)
High	> 130 mg/dl	< 35 mg/dl	< 45 mg/dl	> 400 mg/dl
Intermediate	100 to 129 mg/dl	35 to 45 mg/dl	45 to 55 mg/dl	200 to 399 mg/dl
Low	< 100 mg/dl	> 45 mg/dl	> 55 mg/dl	< 150 mg/dl

What diagnostic tests for hyperlipidemia are appropriate?

Adult patients should be evaluated annually. Testing should include:

- fasting total cholesterol
- fasting triglyceride
- HDL cholesterol
- calculated LDL cholesterol

If all values are normal, less frequent testing may be appropriate. If the lipid profile is abnormal, consideration should be given to correctable secondary causes such as hypothyroidism (which has an increased prevalence in people with diabetes), poor glycemic control, medications (i.e. thiazides, steroids), and alcohol consumption.

What are the thresholds for initiating treatment for hyperlipidemia?

The 2001 Adult Treatment Panel (ATP III) of the National Cholesterol Education Program (NCEP) recognizes diabetes as a CHD risk equivalent. The recommendations for people with diabetes mirror those of a patient with either established CHD or a risk factor profile that would confer a 20 percent ten-year risk of a CHD event. Tools for the convenient calculation of a patient's risk of CHD on a computer or personal digital assistant device may be downloaded from the NCEP[2]. Consideration is not given to gender because it is felt that women and men with diabetes are at a similarly high risk.

What are the treatment goals for hyperlipidemia in persons with diabetes?

Table 14 illustrates hyperlipidemia treatment thresholds for people with CHD or a CHD risk equivalent.

Table 14: Hyperlipidemia Treatment Thresholds for People with CHD/CHD Risk Equivalent

	LDL Goal	LDL level at which to initiate lifestyle Rx	LDL level at which to consider drug Rx
CHD or CHD Equivalent	< 100 mg/dl	> 100 mg/dl	> 130 mg/dl (100 to 129 mg/dl)*

**Some authorities recommend use of LDL lowering drugs if goal LDL < 100 mg/dl cannot be achieved with lifestyle changes.*

**Some authorities recommend treating to less than 70 mg/d if at high risk.*

What are the priorities for management of lipid abnormalities in people with diabetes?

In general, all people with diabetes who have lipid abnormalities should have a trial of medical nutrition therapy, exercise, and optimization of glycemic control. Monitor for previous hepatitis history, obtain baseline liver function studies, and monitor follow-up as indicated. Refer to Table 15 for priorities and options for pharmacologic management of dyslipidemia.

Table 15: Priorities and Options for Pharmacologic Management of Dyslipidemia

Priorities and Options for Pharmacologic Management of Dyslipidemia

First priority is to lower the LDL cholesterol.

- First choice of pharmacologic treatment is a HMG CoA reductase inhibitor (statin).
- Second choice for treatment is a bile acid binding resin (resin), or fenofibrate.
- Improved glycemic control will decrease the LDL level but has a more pronounced effect on lowering elevated triglycerides than on lowering elevated LDL.

Second priority is to raise the level of HDL cholesterol.

- Behavioral interventions such as weight loss, increased physical activity, and tobacco cessation may be useful.
- Pharmacologic treatment is generally not very effective.
- Nicotinic acid may be used, but is relatively contraindicated due to its potential to worsen glycemic control.

Third priority is to lower the triglyceride level.

- The best method to lower the triglyceride level is to achieve glycemic control.
- Fibric acid derivative (gemfibrozil or fenofibrate) is the second management option.
- Treatment with statins is moderately effective at high dosages in hypertriglyceridemic subjects who also have high LDL cholesterol. Newer statin drugs such as atorvastatin may offer advantages for lowering triglycerides and raising HDL.

If there is combined hyperlipidemia:

First choice of therapy:

1. Improved glycemic control plus high dose statin

Second therapy choice:

1. Improved glycemic control plus statin plus fibric acid derivative (gemfibrozil, fenofibrate)

Third therapy choice:

1. Improved glycemic control plus resin plus fibric acid derivative, or
2. Improved glycemic control plus statin plus nicotinic acid†* (glycemic control must be monitored carefully)

†*The combination of statins with nicotinic acid (niacin) and especially with gemfibrozil may carry an increased risk of myositis.*

**Nicotinic acid must be used with caution because of a tendency to worsen glycemic control.*

References:

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